

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

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## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing 8/23/05  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2005/001295

International filing date (day/month/year)  
14.01.2005

Priority date (day/month/year)  
14.01.2004

International Patent Classification (IPC) or both national classification and IPC  
H01Q15/00

*Chapter II Demand*  
*ext: 10/23/05*  
*due: 11/23/05*

Applicant  
THE PENN STATE RESEARCH FOUNDATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

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The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
- ☒ claims Nos. 43,44

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 43,44 are so unclear that no meaningful opinion could be formed (*specify*):

**see separate sheet**

- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☐ no international search report has been established for the whole application or for said claims Nos.
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
  - the written form ☐ has not been furnished
  - ☐ does not comply with the standard
  - the computer readable form ☐ has not been furnished
  - ☐ does not comply with the standard
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.
- ☐ See separate sheet for further details

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	2,3,5,7-24,27-35,37-42
	No: Claims	1,4,6,25,26,36
Inventive step (IS)	Yes: Claims	3,5,12,22-24,37-42
	No: Claims	1,2,4,6-11,13-21,25,26,36
Industrial applicability (IA)	Yes: Claims	1-42
	No: Claims	

2. Citations and explanations

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

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AUTHORITY (SEPARATE SHEET)**

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**Re Item III**

**Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. Claims 43,44 contain references to the description and/or the drawings. According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here.

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:  
D1 : US 2003/034933 A1 (FRENKEL AVRAHAM) 20 February 2003 (2003-02-20)  
D2 : DAWEI ZHANG ET AL: "OPTICAL CONTROL OF MILLIMETER WAVE HIGH TC SUPERCONDUCTING QUASI-OPTICAL BANDPASS FILTERS" APPLIED PHYSICS LETTERS, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, vol. 58, no. 14, 8 April 1991 (1991-04-08), pages 1560-1562, XP000209763 ISSN: 0003-6951  
D3 : US 2002/167457 A1 (MCKINZIE WILLIAM E ET AL) 14 November 2002 (2002-11-14)  
D4: L. DAI ET AL: "sensor and sensor arrays based on conjugated polymers and carbon nanotubes" PURE APPL. CHEM., vol. 74, no. 9, 2002, pages 1753-1772, XP002340646
2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
  - 2.1 Document D1 discloses (the references in parentheses applying to this document): a frequency selective surface (10) comprising a periodically replicated unit cell (16), the unit cell including a chemoresistive material having an electrical conductivity that changes in a presence of an analyte (cf. §16).
3. The present application does not meet the criteria of Article 33(1) PCT, because the

subject-matter of claim 13-16 is not inventive in the sense of Article 33(3) PCT.

- 3.1 The use of an FSS as specified in claims 13-16 is considered to be ordinary practice, well-known to the person skilled in the art.
4. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 17 is not inventive in the sense of Article 33(3) PCT.
- 4.1 Document D2 discloses (cf. fig. 3): a process for detecting an analyte, the process comprising:
  - a) providing an apparatus including a resistive material, the resistive material having an electrical conductivity that changes on exposure to the analyte;
  - b) determining an electromagnetic property of the apparatus, the electromagnetic property being correlated with the electrical conductivity of the chemoresistive material; and
  - c) detecting the analyte using the electromagnetic property.

The subject-matter of claim 17 therefore differs from this known process in that the resistive material is a chemoresistive material.

The solution proposed in claim 17 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT), because the use of chemoresistive materials is well-known, see for example D4.

5. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 25 is not new in the sense of Article 33(2) PCT.
- 5.1 As claim 25 is identical to claim 1, also claim 25 is not novel, cf. point 2 and 2.1.
6. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 32 is not inventive in the sense of Article 33(3) PCT.
- 6.1 The argumentation provided in point 4 and 4.1 applies to claim 32 *mutatis mutandis*.

7. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 36 is not new in the sense of Article 33(2) PCT.
- 7.1 Document D3 discloses (the references in parentheses applying to this document): an apparatus including a frequency selective surface FSS (400), the FSS comprising a pattern of conductive patches (410), the conducting patches being selectively interconnectable by a matrix of independently addressable switches (412).
8. Dependent claims 2, 4, 6-11, 17-21, 26 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (claims 4,6,26) and/or inventive step (claims 2,7-11,17-21) (Article 33(2) and (3) PCT).
9. The technical features present in claims 3, 5, 12, 22 (23), 24, 37 (38-40), 41, 42 appear to satisfy the requirements of the PCT for what concerns novelty and inventive step.

**Re Item VIII**

**Certain observations on the international application**

1. Although claims 1,25,32,36 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.
2. Throughout the set of claims the formulation '*chemoresistive material*' is not clear, as this is considered not to belong to the customary vocabulary of the person skilled in the art.
3. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D4 is not mentioned in the description, nor are these documents identified therein.

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AUTHORITY (SEPARATE SHEET)**

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